

December 6, 2001

Mr. Ken Zmudzinski  
City of South Bend Department of Public Works  
3113 Riverside Drive  
South Bend, Indiana 46628

Re: 141-14909  
First Minor Source Modification to:  
Part 70 permit No. T141-7434-00160

Dear Mr. Zmudzinski:

City of South Bend Department of Public Works was issued Part 70 operating permit T141-7434-00160 on December 19, 1998 for a stationary municipal wastewater treatment plant. An application to modify the source was received on September 5, 2001. Pursuant to 326 IAC 2-7-10.5 the following emission units are approved for construction at the source:

- (a) One (1) 2.91 mmBtu per hour, natural gas fired, lean-burn, reciprocating engine for the #1 pump identified as EU1 exhausting to S1.
- (b) One (1) 7.61 mmBtu per hour, natural gas fired, rich-burn, reciprocating engine for the #2 blower identified as EU3 exhausting to S3. This blower operates as a backup to EU4 and cannot, by its design, operate simultaneously with EU4.
- (c) One (1) 8.62 mmBtu per hour, digester gas and natural gas fired, rich-burn, reciprocating engine for the #1 blower identified as EU4 exhausting to S4.

The following construction conditions are applicable to the proposed project:

General Construction Conditions

1. The data and information supplied with the application shall be considered part of this source modification approval. Prior to any proposed change in construction which may affect the potential to emit (PTE) of the proposed project, the change must be approved by the Office of Air Quality (OAQ).

2. This approval to construct does not relieve the permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.
3. Effective Date of the Permit  
Pursuant to IC 13-15-5-3, this approval becomes effective upon its issuance.
4. Pursuant to 326 IAC 2-1.1-9 and 326 IAC 2-7-10.5(i), the Commissioner may revoke this approval if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.
5. All requirements and conditions of this construction approval shall remain in effect unless modified in a manner consistent with procedures established pursuant to 326 IAC 2.
6. Pursuant to 326 IAC 2-7-10.5(l) the emission units constructed under this approval shall not be placed into operation prior to revision of the source's Part 70 Operating Permit to incorporate the required operation conditions.

The source may begin construction and operation when the minor source modification has been issued. Operating conditions shall be incorporated into the Part 70 operating permit as a minor permit modification in accordance with 326 IAC 2-7-10.5(l)(2) and 326 IAC 2-7-12.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. Pursuant to Contract No. A305-0-00-36, IDEM, OAQ has assigned the processing of this application to Eastern Research Group, Inc., (ERG). Therefore, questions should be directed to Mike Heaney, ERG, 1600 Perimeter Park, Morrisville, North Carolina 27560, or call (919) 468-7870 to speak directly to Mr. Heaney.

Sincerely,

Original Signed by Paul Dubenetzky  
Paul Dubenetzky, Chief  
Permits Branch  
Office of Air Quality

Attachments  
ERG/MH

cc: File - St. Joseph County  
U.S. EPA, Region V  
St. Joseph County Health Department  
Northern Regional Office  
Air Compliance Section Inspector - Rick Reynolds  
Compliance Data Section - Karen Nowak  
Administrative and Development - Sara Cloe  
Technical Support and Modeling - Michele Boner

# **PART 70 OPERATING PERMIT OFFICE OF AIR QUALITY**

**City of South Bend Department of Public Works  
3113 Riverside Drive  
South Bend, Indiana 46628**

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 and 326 IAC 2-1-3.2 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Operation Permit No.: T141-7434-00160	
Issued by: Janet G. McCabe, Assistant Commissioner Office of Air Quality	Issuance Date: December 19, 1998  Expiration Date: December 18, 2003

Minor Source Modification: No.: 141-14909-00160	Pages affected: 2, 24, 24a
Issued by: Original Signed by Paul Dubenetzky Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: December 6, 2001

## SECTION A

## SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Quality (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 through A.3 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

### A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

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The Permittee owns and operates a stationary municipal wastewater treatment plant.

Responsible Official: John Dillon, Director Environmental Services  
Source Address: 3113 Riverside Drive, South Bend, Indiana 46628  
Mailing Address: Division of Environmental Services, 3113 Riverside Drive  
South Bend, Indiana 46628  
SIC Code: 4952  
County Location: St. Joseph  
County Status: Attainment for all criteria pollutants  
Source Status: Part 70 Permit Program  
Minor Source, under PSD;  
Major Source, Section 112 of the Clean Air Act

### A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(15)]

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This stationary source consists of the following emission units and pollution control devices:

- (a) One (1) 2.91 MMBtu per hour, natural gas fired, lean-burn, reciprocating engine for the #1 pump identified as EU1 exhausting to S1, and one (1) 2 MMBtu per hour, diesel fuel and methane fired (with natural gas and methane as alternative fuels), reciprocating engine for the #2 pump identified as EU2 installed in 1955 and exhausting to S2.
- (b) One (1) 7.61 MMBtu per hour, natural gas fired, rich-burn, reciprocating engine for the #2 blower identified as EU3 exhausting to S3, and one (1) 8.62 MMBtu per hour, digester gas and natural gas fired, rich-burn, reciprocating engine for the #1 blower identified as EU4 exhausting to S4. Blower EU3 operates as a backup to EU4; they cannot, by its design, operate simultaneously.
- (c) VAREC Methane flare/ waste gas burner, with a maximum unit capacity of 96.78 standard cubic feet, identified as EU 5, exhausting to S5.

### A.3 Specifically Regulated Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

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This stationary source also includes the following insignificant activities which are specifically regulated, as defined in 326 IAC 2-7-1(21):

- (1) The following equipment related to manufacturing activities not resulting in the emission of HAPs: brazing equipment, cutting torches, soldering equipment, welding.
- (2) Degreasing operations that do not exceed 145 gallons per 12 months, except if subject to 326 IAC 20-6.

- (d) Unless otherwise specified in this permit, any report shall be submitted within thirty (30) days of the end of the reporting period.
- (e) All instances of deviations as described in Section B - Deviations from Permit Requirements Conditions must be clearly identified in such reports.
- (f) Any corrective actions or response steps taken as a result of each deviation must be clearly identified in such reports.
- (g) The first report shall cover the period commencing on the date of issuance of this permit and ending on the last day of the reporting period.

The documents submitted pursuant to this condition do not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

### **Stratospheric Ozone Protection**

#### **C.22 Compliance with 40 CFR 82 and 326 IAC 22-1**

Pursuant to 40 CFR 82 (Protection of Stratospheric Ozone), Subpart F, except as provided for motor vehicle air conditioners in Subpart B, the Permittee shall comply with the standards for recycling and emissions reduction:

- (a) Persons opening appliances for maintenance, service, repair, or disposal must comply with the required practices pursuant to 40 CFR 82.156.
- (b) Equipment used during the maintenance, service, repair, or disposal of appliances must comply with the standards for recycling and recovery equipment pursuant to 40 CFR 82.158.
- (c) Persons performing maintenance, service, repair, or disposal of appliances must be certified by an approved technician certification program pursuant to 40 CFR 82.161.

### **SECTION D.1**

### **FACILITY OPERATION CONDITIONS**

#### **Facility Description [326 IAC 2-7-5(15)]**

- (a) One (1) 2.91 MMBtu per hour, natural gas fired, lean-burn, reciprocating engine for the #1 pump identified as EU1 exhausting to S1, and one (1) 2 MMBtu per hour, diesel fuel and methane fired (with natural gas and methane as alternative fuels), reciprocating engine for the #2 pump identified as EU2 installed in 1955 and exhausting to S2.
- (b) One (1) 7.61 MMBtu per hour, natural gas fired, rich-burn, reciprocating engine for the #2 blower identified as EU3 exhausting to S3, and one (1) 8.62 MMBtu per hour, digester gas and natural gas fired, rich-burn, reciprocating engine for the #1 blower identified as EU4 exhausting to S4. Blower EU3 operates as a backup to EU4; they cannot, by its design, operate simultaneously.
- (c) VAREC Methane flare/ waste gas burner, with a maximum unit capacity of 96.78 standard cubic feet, identified as EU 5, exhausting to S5.

## **Emission Limitations and Standards [326 IAC 2-7-5(1)]**

### **D.1.1 General Operation**

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Any change or modification which may increase potential emissions from the equipment covered in this permit shall obtain prior approval from the Office of Air Quality (OAQ).

## **Compliance Determination Requirements**

### **D.1.2 Testing Requirements [326 IAC 2-7-6(1), (6)]**

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The Permittee is not required to test this facility by this permit. However, IDEM may require compliance testing at any specific time when necessary to determine if the facility is in compliance. If testing is required by IDEM, compliance shall be determined by a performance test conducted in accordance with Section C - Performance Testing.

# **Indiana Department of Environmental Management Office of Air Quality**

## **Technical Support Document (TSD) for a Part 70 Minor Source Modification and a Part 70 Minor Permit Modification**

### **Source Background and Description**

Source Name:	City of South Bend Department of Public Works
Source Location:	3113 Riverside Drive, South Bend, Indiana 46628
County:	St. Joseph
SIC Code:	4952
Operation Permit No.:	T141-7434-00160
Operation Permit Issuance Date:	December 19, 1998
Minor Source Modification No.:	141-14909-00160
Minor Permit Modification No.:	141-14959-00160
Permit Reviewer:	ERG/MH

The Office of Air Quality (OAQ) has reviewed a modification application from the City of South Bend relating to the construction and operation of the following emission units and pollution control devices:

- (a) One (1) 2.91 MMBtu per hour, natural gas fired, lean-burn, reciprocating engine for the #1 pump identified as EU1 exhausting to S1.
- (c) One (1) 7.61 MMBtu per hour, natural gas fired, rich-burn, reciprocating engine for the #2 blower identified as EU3 exhausting to S3. This blower operates as a backup to EU4 and cannot, by its design, operate simultaneously with EU4.
- (d) One (1) 8.62 MMBtu per hour, digester gas and natural gas fired, rich-burn, reciprocating engine for the #1 blower identified as EU4 exhausting to S4.

### **History**

On September 5, 2001, the City of South Bend submitted an application to the OAQ requesting to replace one 2 MMBtu per hour engine with a 2.91 MMBtu per hour engine; a 5 MMBtu per hour engine with a 7.61 MMBtu per hour engine, and; a 5 MMBtu per hour engine with a 8.62 MMBtu per hour engine. The new engines, like the engines they are replacing will be used at the wastewater treatment plant. The City of South Bend Department of Public Works was issued a Part 70 permit on December 19, 1998.

### **Enforcement Issue**

There are no enforcement actions pending.

### Stack Summary (New emission units only)

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
S1	Pump Engine #1	18.2	0.67	1,550	600
S3	Blower Engine #2	33.4	1.08	1,790	740
S4	Blower Engine #1	33.4	1.08	1,790	740

### Recommendation

The staff recommends to the Commissioner that the Part 70 Minor Source Modification be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on September 5, 2001.

### Emission Calculations

See pages 1 through 3 of Appendix A of this document for detailed emissions calculations.

### Potential To Emit of Modification

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA.”

This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Pollutant	Potential To Emit (tons/year)
PM	0.86
PM-10	0.86
SO <sub>2</sub>	0.03
VOC	2.62
CO	144.55
NO <sub>x</sub>	135.39

HAP's	Potential To Emit (tons/year)
formaldehyde	1.45
acetaldehyde	0.21
acrolein	0.16
methanol	0.15
benzene	0.07
TOTAL	less than 25

### Justification for Modification

The Part 70 Operating permit is being modified through a Part 70 Minor Source Modification even though the potential to emit NO<sub>x</sub> is greater than twenty-five (25) tons per year and the potential to



emit CO is greater than one hundred (100) tons per year. Pursuant to 326 IAC 2-7-10.5(d)(9), this modification is minor because the new engines are "of the same type that are already permitted and that will comply with the same applicable requirements and permit terms." The permit modification for approval to operate is being performed pursuant to 326 IAC 2-7-12(b).

### County Attainment Status

The source is located in St. Joseph County.

Pollutant	Status
PM-10	attainment
SO <sub>2</sub>	attainment
NO <sub>2</sub>	maintenance
Ozone	maintenance
CO	attainment
Lead	attainment

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) are precursors for the formation of ozone. Therefore, VOC and NO<sub>x</sub> emissions are considered when evaluating the rule applicability relating to the ozone standards. St. Joseph County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO<sub>x</sub> emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) St. Joseph County has been classified as attainment or unclassifiable for all other pollutant(s). Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (c) Fugitive Emissions  
 Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive PM emissions are not counted toward determination of PSD and Emission Offset applicability.

### Existing Source Status Before Modification

Existing Source PSD or Emission Offset Definition (emissions after controls, based upon 8760 hours of operation per year at rated capacity and/or as otherwise limited):

Pollutant	Emissions (tons/year)
PM	11.60
PM-10	11.60
SO <sub>2</sub>	12.53
VOC	13.20
CO	93.60
NO <sub>x</sub>	168.88

- (a) This existing source is not a major stationary source because no attainment regulated pollutant is emitted at a rate of 250 tons per year or more, and it is not one of the 28 listed source categories.
- (b) These emissions are based on the TSD for permit T141-7434-00160.

## Potential to Emit of Modification After Issuance

The table below summarizes the potential to emit, reflecting all limits, of the significant emission units after controls. The control equipment is considered federally enforceable only after issuance of this Part 70 source modification.

	Potential to Emit (tons/year)						
Process/facility	PM	PM-10	SO <sub>2</sub>	VOC	CO	NO <sub>x</sub>	HAPs
New engines (EU1, EU3, and EU4)	0.86	0.86	0.03	2.62	144.55	135.39	less than 25
Entire source	3.71	3.71	3.28	18.33	167.81	178.00	less than 25
PSD threshold significant levels	250	250	250	250	250	250	--

This modification to an existing minor stationary source is not major because the emission increase is less than the PSD significant levels. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

## Federal Rule Applicability

- (a) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this proposed modification.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this proposed modification.

## State Rule Applicability - Entire Source

### 326 IAC 2-6 (Emission Reporting)

This source is subject to 326 IAC 2-6 (Emission Reporting), because it has the potential to emit more than one hundred (100) tons per year) of NO<sub>x</sub>. Pursuant to this rule, the owner/operator of the source must annually submit an emission statement for the source. The annual statement must be received by April 15 of each year and contain the minimum requirement as specified in 326 IAC 2-6-4. The submittal should cover the period defined in 326 IAC 2-6-2(8) (Emission Statement Operating Year).

### 326 IAC 5-1 (Visible Emissions Limitations)

This source is located in the area north of Kern Road and east of Pine Road in St. Joseph County. Therefore, 326 IAC 5-1-2(2) applies. Except as provided in 326 IAC 5-1-3 (Temporary Exemptions), visible emissions shall meet the following, unless otherwise stated in this permit:

- (a) Visible emissions shall not exceed an average of thirty percent (30%) opacity in twenty-four (24) consecutive readings as determined by 326 IAC 5-1-4,
- (b) Visible emissions shall not exceed sixty percent (60%) opacity for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) in a six (6) hour period.

### 326 IAC 10 (Nitrogen Oxide Rules)

These emission units are not located in Clark or Floyd County. Therefore, IAC 326 10-1-4 does not apply.

### **State Rule Applicability - Individual Facilities**

#### **326 IAC 9 (Carbon Monoxide Emission Rules)**

These emission units are not of a category limited by 9-1-2; therefore, this article does not apply.

### **Compliance Requirements**

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis. All state and federal rules contain compliance provisions, however, these provisions do not always fulfill the requirement for a more or less continuous demonstration. When this occurs IDEM, OAQ, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, compliance requirements are divided into two sections: Compliance Determination Requirements and Compliance Monitoring Requirements.

Compliance Determination Requirements in Section D of the permit are those conditions that are found more or less directly within state and federal rules and the violation of which serves as grounds for enforcement action. If these conditions are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

The compliance monitoring requirements applicable to this modification are as follows:

1. Each engine has applicable compliance monitoring conditions as specified below:
  - (a) Visible emissions notations of the reciprocating engine stack exhaust shall be performed once per shift during normal daylight operations. The frequency of monitoring is being increased from daily to once per shift because all of the engines, except for one to be used only in a backup capacity, are being replaced and once-per-shift monitoring is the current OAQ protocol for this type of emission unit. A trained employee will record whether emissions are normal or abnormal.
  - (b) For processes operated continuously "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.
  - (c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.
  - (d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process. Daily visible emissions notations of the reciprocating engine stack exhaust shall be performed during normal daylight operations. A trained employee will record whether emissions are normal or abnormal.
  - (e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and corrective actions for when an abnormal emission is observed.

## Proposed Changes

### A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

The Permittee owns and operates a stationary municipal wastewater treatment plant.

Responsible Official: ~~Ken Zmudzinski~~ **John Dillon, Director Environmental Services**

### A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(15)]

This stationary source consists of the following emission units and pollution control devices:

- (a) **One (1) 2.91 MMBtu per hour, natural gas fired, lean-burn, reciprocating engine for the #1 pump identified as EU1 exhausting to S1, and one (1) 2 MMBtu per hour, diesel fuel and methane fired (with natural gas and methane as alternative fuels), reciprocating engine for the #2 pump identified as EU2 installed in 1955 and exhausting to S2.** ~~Two (2) 2MMBtu per hour diesel fuel and methane fired reciprocating engines for pumping, with natural gas and methane as alternative fuels, identified as EU 1 and 2 were installed in 1955 and exhaust to stacks 1 and 2 and~~
- (b) **One (1) 7.61 MMBtu per hour, natural gas fired, rich-burn, reciprocating engine for the #2 blower identified as EU3 exhausting to S3, and one (1) 8.62 MMBtu per hour, digester gas and natural gas fired, rich-burn, reciprocating engine for the #1 blower identified as EU4 exhausting to S4. Blower EU3 operates as a backup to EU4; they cannot, by its design, operate simultaneously.** ~~two (2) 5MMBtu per hour diesel fuel and methane fired reciprocating engines operating as compressor blowers with natural gas and methane as alternative fuels, identified as EU 3 and 4 were installed in 1955 and exhaust to stacks 3 and 4.~~
- (c) VAREC Methane flare/ waste gas burner, with a maximum unit capacity of 96.78 standard cubic feet, identified as EU 5, exhausting to ~~stack~~**S5.**

## SECTION D.1

## FACILITY OPERATION CONDITIONS

### Facility Description [326 IAC 2-7-5(15)]

- (a) **One (1) 2.91 MMBtu per hour, natural gas fired, lean-burn, reciprocating engine for the #1 pump identified as EU1 exhausting to S1, and one (1) 2 MMBtu per hour, diesel fuel and methane fired (with natural gas and methane as alternative fuels), reciprocating engine for the #2 pump identified as EU2 installed in 1955 and exhausting to S2.** ~~Two (2) 2MMBtu per hour diesel fuel and methane fired reciprocating engines for pumping, with natural gas and methane as alternative fuels, identified as EU 1 and 2 were installed in 1955 and exhaust to stacks 1 and 2 and~~
- (b) **One (1) 7.61 MMBtu per hour, natural gas fired, rich-burn, reciprocating engine for the #2 blower identified as EU3 exhausting to S3, and one (1) 8.62 MMBtu per hour, digester gas and natural gas fired, rich-burn, reciprocating engine for the #1 blower identified as EU4 exhausting to S4. Blower EU3 operates as a backup to EU4; they cannot, by its design, operate simultaneously.** ~~two (2) 5MMBtu per hour diesel fuel and methane fired reciprocating engines operating as compressor blowers with natural gas and methane as alternative fuels, identified as EU 3 and 4 were installed in 1955 and exhaust to stacks 3 and 4.~~
- (c) VAREC Methane flare/ waste gas burner, with a maximum unit capacity of 96.78 standard cubic feet, identified as EU 5, exhausting to ~~stack~~**S5.**

## Conclusion

The construction of this proposed modification shall be subject to the conditions of the proposed Part 70 Minor Source Modification No. 141-14909-00160, and the operation of this proposed modification shall be subject to the conditions of the proposed Part 70 Minor Permit Modification No. 141-14957-00160.

**Appendix A: Emission Calculations  
Emission Calculation Summary**

Page 1 of 2

**Company Name: City of South Bend Department of Public Works  
Address City IN Zip: 3113 Riverside Drive, South Bend, Indiana 46628  
CP#: 141-14909  
Plt ID: 141-00160  
Permit Reviewer: ERG/mh  
Date: 12/07/2001**

**Criteria Pollutant Emissions**

<b>Emission Factors</b>	<b>SCC</b>		<b>PM*</b>	<b>PM10*</b>	<b>SO<sub>2</sub></b>	<b>NOx</b>	<b>VOC</b>	<b>CO</b>
NG-fired Engine 4-Stroke Rich	2-02-002-53	lb/MMBtu	1.94E-02	1.94E-02	5.88E-04	2.21	0.03	3.72
NG-fired Engine 4-Stroke Lean	2-02-002-54	lb/MMBtu	9.99E-03	9.99E-03	5.88E-04	4.08	0.12	0.32

\* PM and PM10 emissions are combined filterable and condensable PM.

	<b>Emission Unit Description</b>	<b>Size (HP)</b>	<b>Max Fuel Input (MMBtu/hr)</b>	<b>PM*</b>	<b>PM10</b>	<b>SO<sub>2</sub></b>	<b>NOx</b>	<b>VOC</b>	<b>CO</b>
EU1	Pump Engine #1 (lean)	415	2.905	0.127	0.127	0.007	51.91	1.50	4.03
EU3	Blower Engine #2* (rich)	1000	7.612	0.647	0.647	0.020	73.68	0.99	124.03
EU4	Blower Engine #1 (rich)	1100	8.624	0.733	0.733	0.022	83.48	1.12	140.52
	<b>Total</b>			<b>0.86</b>	<b>0.86</b>	<b>0.03</b>	<b>135.39</b>	<b>2.62</b>	<b>144.55</b>

\* **Blower Engine #2** not included in total because it cannot run at the same time as **Blower Engine #1**, which has larger emissions.

**Methodology**

All Emission factors are based on engines running at full load.

MMBtu = 1,000,000 Btu

MMCF - 1,000,000 Cubic Feet of Gas

Emission Factors from AP-42, Chapter 3.2, Tables 3.2-2 and 3.2-3, SCC #2-02-002-54 and 2-02-002-53  
(AP-42 Supplement F 4/00)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

**Appendix A: Emission Calculations**  
**Emission Calculation Summary**

Page 2 of 2

**Company Name: City of South Bend Department of Public Works**  
**Address City IN Zip: 3113 Riverside Drive, South Bend, Indiana 46628**  
**CP#: 141-14909**  
**Plt ID: 141-00160**  
**Permit Reviewer: ERG/mh**  
**Date: 12/07/2001**

**HAP Emissions**

<b>Emission Factors</b>	<b>SCC</b>		<b>Formaldehyde</b>	<b>Acetaldehyde</b>	<b>Acrolein</b>	<b>Methanol</b>	<b>Benzene</b>
NG-fired Engine 4-Stroke Rich	2-02-002-53	lb/MMBtu	0.02050	0.00279	0.00263	0.00306	0.00158
NG-fired Engine 4-Stroke Lean	2-02-002-54	lb/MMBtu	0.05280	0.00836	0.00514	0.00250	0.00044

	<b>Emission Unit Description</b>	<b>Size (HP)</b>	<b>Max Fuel Input (MMBtu/hr)</b>	<b>Formaldehyde</b>	<b>Acetaldehyde</b>	<b>Acrolein</b>	<b>Methanol</b>	<b>Benzene</b>
EU1	Pump Engine #1 (lean)	415	2.905	0.672	0.106	0.065	0.032	0.006
EU3	Blower Engine #2*	1000	7.612	0.683	0.093	0.088	0.102	0.053
EU4	Blower Engine #1 (rich)	1100	8.624	0.774	0.105	0.099	0.116	0.060
	<b>Total</b>			<b>1.446</b>	<b>0.212</b>	<b>0.165</b>	<b>0.147</b>	<b>0.065</b>

**\* Blower Engine #2 not included in total because it cannot run at the same time as Blower Engine #1, which has larger emissions.**

**Methodology**

All Emission factors are based on engines running at full load.

MMBtu = 1,000,000 Btu

MMCF - 1,000,000 Cubic Feet of Gas

Emission Factors from AP-42, Chapter 3.2, Tables 3.2-2 and 3.2-3, SCC #2-02-002-54 and 2-02-002-53  
 (AP-42 Supplement F 4/00)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton